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EXAMINER

CHUO, TONY SHENG HSIANG

ART UNIT	PAPER NUMBER
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1729

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/790,627	Applicant(s) MATHIOWETZ ET AL.	
	Examiner TONY CHUO	Art Unit 1729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 1-6 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-6 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Response to Amendment

1. Claims 1-6 are currently pending. Claims 7-35 are cancelled. The previous objection to claim 1 is withdrawn. The amended claims do overcome the previously stated 103 rejections. However, upon further consideration, claims 1-6 are rejected under the following new 112 and 103 rejections. This action is made FINAL as necessitated by the amendment.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- Claim 1 recites the limitation "the inner layer" on page 2, line 1. There is insufficient antecedent basis for this limitation in the claim.
- Claim 1 recites the limitation "elongate separate ion bars" and "elongate separate bars" on page 2, lines 17 and 18. There is insufficient antecedent basis for this limitation in the claim.

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- Claim 1 recites the limitation "the electrical outer connects" on page 2, lines 18 and 19. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685) and Thiele et al (US 4599283), and further in view of Toyoda (JP 2001-243927).

Regarding claims 1-3 and 6, the Stafford reference discloses a battery pack comprising: a plurality of battery cells "22" wherein the battery cells are elongate and aligned parallel and side by side (Fig. 5); a plurality of electrical contacts "34" (electrical leads) that are capable of coupling the battery cells to an intrinsically safe hand held instrument (col. 4, lines 9-10); wherein housing support "26" comprises a plurality of opposed split shell segments "26a" and "26b" (first and second half shells) that contacts the cylindrical surface of the battery cells, wherein each split shell segments is positioned in physical contact with opposing side of one of the plurality of battery cell, wherein each split shell segments has a gap therebetween that is capable of allowing thermal expansion of the split shell segments (Fig. 1 and col. 4, lines 31-33); wherein

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the first and second half shells extend in parallel planes and enclosing the plurality of battery cells (Figs. 1 and 5); wherein each split shell segments "26a" & "26b" comprises: a first heat-conductor layer "42" (thermally conductive material/interior layer) that is shaped to conform to a cylindrical portion of the outer surface of the battery cells, terminates at interior layer ends that are on the cylindrical portion of the outer surface of the battery cell, and has a thickness of 0.04 inches and a thermal conductivity of 193 Watts/meter-°K (col. 4, line 56 to col. 5, line 18 and Fig. 4); and a second structural support outer layer "48" (outer layer of thermally insulating material) that is shaped to conform to an outer surface of the first heat-conductor layer, contacts all of the outer surface of the first heat-conductor layer, extends beyond the outer surface to enclose the interior layer ends, defines an exterior surface of the enclosure of the battery cells which separates the battery pack from the environment, and has a thickness of 0.020 inches and a second value of thermal conductivity (col. 5 lines 23-26 and Fig. 4); and a structural base "60" (outer shell) covering the plurality of battery cells (Fig. 5).

Examiner's note: the recitation "for an intrinsically safe hand held portable instrument in an industrial process control system" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

In addition, it is the position of the examiner that “the interior layer of material spreads flow of the heat over a portion of the outer surface of the interior layer that is larger than the hot spot and the outer layer of material retards flow of the heat to an outer surface of the outer layer” and “the temperature of the outer surface of the outer layer has a measured maximum temperature of 130 degrees centigrade or less during the short circuit condition” are inherent properties of a battery cell that has a interior layer of thermally conductive material that is shaped to conform to a cylindrical portion of an outer surface of the battery cell and an outer layer of thermally insulating material that is shaped to form an enclosure of an outer surface of the interior layer. In addition, the Stafford battery pack is also an intrinsically safe electrical energy storage cell pack because of the inherent properties of the battery housing support.

However, Stafford et al does not expressly teach a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound (claim 1). The Izaki reference discloses a battery pack comprising: a plurality of batteries and a protective device including a fusible metal “16” (fusible link) coupled to a terminal “4” (connected lead) and the batteries, wherein the fusible metal is encased in a cover film “18” (potting compound) (Fig. 9 and 13 and paragraphs [0206],[0211]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford battery pack to include a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound in order to prevent overheating of

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the battery during short circuiting by utilizing a fusible metal to break the circuit, thereby assuring safety of the battery.

However, Stafford et al as modified by Izaki et al does not expressly teach a plurality of opposed alternating electrical interconnects arranged to electrically connect ends of adjacent pairs of electrical energy storage cells; a plurality of elongated separation bars positioned at the ends of pairs of adjacent electrical energy storage cells and between the plurality of electrical interconnects to reduce shorting and provide mechanical support, wherein the plurality of elongated separation bars are coupled to the outer shell, wherein the plurality of elongated separation bars extend from the outer shell and slide between the electrical outer connects and the ends of pairs of adjacent electrical energy storage cells (claim 1). Thiele et al discloses a plurality of connector strips "24" (opposed alternating electrical interconnects); and a plurality of connector insulating end walls "40" (elongated separation bars) positioned between the ends of adjacent cells "14" and between the plurality of connector strips "24" to prevent shorting and provide mechanical support, wherein the plurality of connector insulating end walls extend from a base member "42" (outer shell) and slide between the connector strips and the ends of pairs of adjacent cells "14" (col. 4 lines 14-34 and Figs. 2 and 3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki battery pack to include a plurality of opposed alternating electrical interconnects arranged to electrically connect ends of adjacent pairs of electrical energy storage cells; a plurality of elongated separation bars positioned at the ends of pairs of adjacent electrical energy storage

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cells and between the plurality of electrical interconnects to reduce shorting and provide mechanical support, wherein the plurality of elongated separation bars are coupled to the outer shell, wherein the plurality of elongated separation bars extend from the outer shell and slide between the electrical outer connects and the ends of pairs of adjacent electrical energy storage cells in order to electrically connect the cells together for a particular application and to improve the safety of the batteries by preventing the electrical interconnects from shorting and to provide structural rigidity of the housings.

However, Stafford et al as modified by Izaki et al and Thiele et al does not expressly teach a plurality of outer elastic layers of a thermally insulating material having a thermal conductivity which is less than the thermal conductivity of the inner layer, wherein the outer layers comprise heat-shrink tubing (claims 1 and 6). The Toyoda reference discloses a heat shrink member "8" that is also an outer elastic layer that covers a battery (paragraph [0008]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki/Thiele battery housing support to include a plurality of outer elastic layers of a thermally insulating material having a thermal conductivity which is less than the thermal conductivity of the inner layer, wherein the outer layers comprise heat-shrink tubing in order to improve the reliability of the outer package of the battery while preventing the generation of an outside short circuit.

6. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685), Thiele et al (US

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4599283), and Toyoda (JP 2001-243927) as applied to claim 1 above, and further in view of Dansui et al (US 2003/0013009).

However, Stafford et al as modified by Izaki et al, Thiele et al, and Toyoda does not expressly teach a first layer of material that comprises aluminum or copper (claims 4 and 5). The Dansui reference discloses a battery housing that is made of aluminum or copper (paragraph [0013]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki/Thiele/Toyoda battery housing support to include a first layer of material that comprises aluminum or copper in order to utilize a material that has excellent thermal conduction properties and is suited for suppressing a battery temperature rise.

Response to Arguments

7. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TONY CHUO whose telephone number is (571)272-0717. The examiner can normally be reached on M-F, 9:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ula Ruddock can be reached on (571) 272-1481. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

/ULA C. RUDDOCK/
Supervisory Patent Examiner, Art Unit 1729